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ART UNIT	PAPER NUMBER

2775 *8***DATE MAILED:** 10/07/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/984,059	Applicant(s) JUN IL SONG
	Examiner John G. Lim	Group Art Unit 2775

Responsive to communication(s) filed on Dec 3, 1997.

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 1-15 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 1-15 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) _____.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119, which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because of the problem addressed in the attached PTO-948. Correction is required.
3. Figure 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

On page 1, line 15-page 9, line 14, under Description of the Prior Art in the disclosure, Applicant admitted Fig. 1 and 2 as the prior art.

Claim Rejections - 35 U.S.C. § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 5-10 and 13-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On page 34, line 11-page 35, line 8, the specification discusses “an asynchronous four-wire manner” and shows the drawing in fig. 6A. However, claims 5 and 13 claim “a single data signal line adapted to carry out a bi-directional data transmission/reception in an asynchronous manner” whereas claims 9 and 14 claim “two data signal lines each adapted to carry out an uni-directional data transmission/reception in an asynchronous manner.” It does not specify if “the asynchronous four wire manner” is a single data signal line adapted to carry out a bi-directional data transmission/reception in an asynchronous manner or two data signal lines each adapted to carry out an uni-directional data transmission/reception in an asynchronous manner.

In claims 9 and 14, “two data signal lines each adapted to carry out an uni-directional data transmission/reception in an asynchronous manner” is not clearly specified. Are they “two data signal lines” in one serial line or “two data signal lines” in two serial lines ?

In claims 10 and 15, “a single direction” is not clearly specified. Is it one bi-directional serial line or just one transmit line ?

Dependent claims 6-8 are rejected as being dependent on a rejected base claim.

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Claim Rejections - 35 U.S.C. § 103

Claims 5-10 and 13-15 are rejected below as best understood.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marcade et al (U.S. PAT NO. 4,646,528; hereinafter simply referred to as Marcade) in view of Fowler et al (U.S. PAT NO. 5,616,269; hereinafter simply referred to as Fowler).

As to independent claims 1 and 3, Marcade teaches a display unit (34 a, b, c in fig. 1 and fig. 2) of a refrigerator mounted on outer case of the refrigerator that receive signals generated by the key buttons (36a-36j in fig. 2) and output the seven-segment LED displays decoded by microcomputer CPU 44 on col. 3, line 56-col. 4, line 7; and a microcomputer (controller 42 in fig. 3) interpreting the sequence of the key input signals as a command to display the encoded values on col. 10, lines 23-26.

Marcade teaches single lines (60 in fig. 3) connection between controller (42 in fig. 3) and display unit (62 in fig. 3), but does not mentioned that the single lines are a data signal line adapted to transmit data between the display unit and the control means in a serial manner.

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Fowler teaches the method of serial communication protocol to pass information between the display unit (display control module 25 in fig. 8B) and the controller (power module 26 in fig. 8B) through a serial line (27 in fig. 8B) on col.6, lines 41-50, and when the user enters the key, the information is converted into data that is communicated through the serial I/O port on col. 25, lines 50-54. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refrigerator controller and display device of Marcade to add Fowler's serial communication protocol method so that the wiring can be reduced from twenty wires of parallel line to less than ten wires of serial line, and production cost can be saved a lot if the wiring connection is very long on col. 8, lines 15-26.

As to independent claims 11 and 12, Marcade teaches a external display device of refrigerator (see fig. 1) adapted to display an operating state of refrigerator (selected key indicators 38 a-h, and temperature indicators 40 a-b in fig. 2) while enabling a key selection for controlling the refrigerator, comprising inputting the output data by the key buttons (36a-36j in fig. 2) on col. 3, line 56-58, decoding the data by microcomputer CPU 44, and executing a control based on the decoded data by the microcomputer (controller 42 in fig. 3) on col. 10, lines 23-26.

Marcade teaches single lines (60 in fig. 3) connection between controller (42 in fig. 3) and display unit (62 in fig. 3), but does not mention that the single lines are the serial lines for the serial data. Also, Marcade does not mention the step of converting the data into serial data,

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determining whether a right of data transmission is assigned to the external display device or to a control unit, and checking whether or not a right of data transmission is assigned.

Fowler teaches the method of serial communication protocol to pass information between the display unit (display control module 25 in fig. 8B) and the controller (power module 26 in fig. 8B) through a serial line (27 in fig. 8B) on col.6, lines 41-50, and when the user enters the key, the information is converted into data that is communicated through the serial I/O port on col. 25, lines 50-54. Also, Fowler teaches “handshake” line between the external display device (display control module 25 in fig 8B) and the control unit (power module 26 in fig. 8B) for determining and checking process for the serial line on col. 6, lines 43-48. In addition, “handshake” is an exchange of signals over specific wires, in which each device indicates its readiness to send or receive data, and it is well known in the art.

As to claim 2, Marcade teaches the display unit (34 a, b, c in fig. 1 and fig. 2) and the control means decodes the data by microcomputer CPU 44, and executing a control based on the decoded data by the microcomputer (controller 42 in fig. 3) on col. 10, lines 23-26. Fowler teaches the method of serial communication protocol to pass information between the display unit (display control module 25 in fig. 8B) and the controller (power module 26 in fig. 8B) through a serial line (27 in fig. 8B) on col.6, lines 41-50, and when the user enters the key, the information is converted into data that is communicated through the serial I/O port on col. 25, lines 50-54.

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As to claim 4, Marcade teaches the display unit comprises auxiliary control (LED driver 62 in fig. 3) means for receiving a command from the control (microprocessor 62 in fig. 3) means, thereby executing an intermediate control until the operating state of the refrigerator is displayed on col. 3, lines 64-68.

8. Claims 5-6, 8-10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marcade in view of Fowler as applied to claim 3 above, and further in view of Gaudet et al (U.S. PAT NO. 5,265,431; hereinafter simply referred to as Gaudet).

As to claims 5, 9-10 and 13-15, Fowler teaches a serial line comprising two data signal lines (serial input and serial output) and the clock signal in sync with “handshake” on col. 6, lines 41-48. Gaudet teaches a serial line comprising RS-232 line in asynchronous manner. However, “handshake” technique can be used for any serial line and it is capable of making simplex (sending data in one direction only), half-duplex (sending data in one direction at a time) or duplex transmission (sending data in both direction at the same time), and it is well known in the art.

As to claim 6, Marcade teaches a voltage supply line (V_{LED}) on col. 3, line 66-col. 4, line 2.

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As to claim 8, Fowler teaches a serial line in sync. and Gaudet teaches a serial line in async., and it is well known in the art that serial communication uses a coordinated data stream that has start bit, control bit, data bit and stop bit.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marcade in view of Fowler and Gaudet as applied to claims 3 and 5-7 above, and further in view of Admitted Prior Art (page 8, line 25-page 9, line 9; hereinafter simply referred to as APA).

As to claim 7, APA teaches that transmit signal lines connected between the control unit 20 mounted in the refrigerator body and the display device 20 attached to the outer surface of the door, through the hinge hole 31 of the hinge 30 on page 9, lines 1-4.

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Inquiries

10. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)

Or:

(703) 308-6606 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

*Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington,
VA., Sixth Floor (Receptionist).*

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John G. Lim whose telephone number is (703)306-2988. The examiner can normally be reached on Monday--Friday from 7:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Saras, can be reached on (703)305-4718.

JGL

September 27, 1999



STEVEN J. SARAS
SUPERVISORY PATENT EXAMINER
GROUP 2700